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Sebastiano Battiato · Jacques Blanc-Talon  
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Dan Popescu · Paul Scheunders (Eds.)

# Advanced Concepts for Intelligent Vision Systems

16th International Conference, ACIVS 2015  
Catania, Italy, October 26–29, 2015  
Proceedings

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## Preface

These proceedings gather the selected papers of the Advanced Concepts for Intelligent Vision Systems (ACIVS) conference which was held in Catania, Italy, during October 26–29, 2015.

This event was the 16th ACIVS. After the first event in Germany in 1999, ACIVS has become a larger and independent scientific conference. However, the seminal distinctive governance rules have been maintained:

- To update the conference scope on a yearly basis. While keeping a technical backbone (the classic low-level image processing techniques), we have introduced topics of interest such as – chronologically – image and video compression, 3D, surveillance, etc., in order to fit the conference scope to our scientific community's needs. In addition, speakers usually give invited talks on hot issues.
- To remain a single-track conference in order to promote scientific exchanges within the audience.
- To grant oral presentations a duration of 25 minutes and published papers a length of 12 pages, which is significantly different from most other conferences.

The second and third items generate a complex management of the conference; in particular, the number of time slots is rather small. Although the selection between the two presentation formats is primarily determined by the need to compose a well-balanced program, papers presented during plenary and poster sessions enjoy the same importance and publication format.

The first item is strengthened by the notoriety of ACIVS, which has been growing over the years: official 2015 Springer records show a cumulated number of downloads on January 1, of more than 325,000.

ACIVS 2015 started with a special session on the topic of large-scale video processing and embedded intelligence highlighted by invited talks from Michael Tcha gaspanian (CEA, France) and Alessandro Capra (STMicroelectronics, Italy). The goal of this special session was to facilitate discussion of the state of the art and future challenges in the booming research area of computer vision and video processing for interconnected camera systems. The session provided an opportunity for liaison between academic and industrial research and development in this field demonstrated by several successful cross-national projects and collaborations whose representatives were among the session participants.

The regular sessions also included a couple of invited talks by Prof. Raimondo Schettini (University of Milano Bicocca) and Prof. Gabriela Csurka (Xerox Research Centre Europe). We would like to thank all of them for enhancing the technical program with their presentations.

ACIVS 2015 attracted submissions from many different countries, mostly from Europe, but also from the rest of the world: Algeria, Australia, Austria, Brazil, Belgium, Canada, China, Cyprus, Czech Republic, Denmark, Ecuador, France, Finland,

Germany, Hungary, India, Israel, Italy, Korea, Mexico, The Netherlands, Poland, Romania, Russia, Switzerland, Taiwan, Tunisia, Turkey, the Ukraine, United Arab Emirates, the UK, and the USA.

From 129 submissions, 35 were selected for oral presentation and 41 as posters. The paper submission and review procedure was carried out electronically and a minimum of three reviewers were assigned to each paper. A large and energetic Program Committee (87 people), helped by additional referees (about 150 people in total), as listed on the following pages, completed the long and demanding reviewing process. We would like to thank all of them for their timely and high-quality reviews, achieved in quite a short time and just before the summer holidays.

Also, we would like to thank our sponsors (in alphabetical order) Antwerp University, University of Catania, CSIRO (Commonwealth Scientific and Industrial Research Organization), Ghent University, and GIRPR (Gruppo Italiano Ricercatori in Pattern Recognition) for their valuable support.

Finally, we would like to thank all the participants who trusted in our ability to organize this conference for the 16th time. We hope they attended a different and stimulating scientific event and that they enjoyed the atmosphere of the ACIVS social events in the city of Catania.

As explained, a conference like ACIVS would not be feasible without the concerted effort of many people and the support of various institutions. We are indebted to the local organizers for having smoothed all the harsh practical details of an event venue, and we hope to welcome them in the near future.

July 2015

Sebastiano Battiato  
Jacques Blanc-Talon  
Giovanni Gallo  
Wilfried Philips  
Dan Popescu  
Paul Scheunders

## About the Volume Editors

Sebastiano Battiato received his degree in computer science (*summa cum laude*) in 1995 from the University of Catania and his PhD in computer science and applied mathematics from the University of Naples in 1999. From 1999 to 2003 he was the leader of the “Imaging” team at STMicroelectronics in Catania. He joined the Department of Mathematics and Computer Science at the University of Catania as assistant professor in 2004 and became associate professor in the same department in 2011. His research interests include image enhancement and processing, image coding, camera imaging technology, and multimedia forensics. He has edited six books and co-authored more than 180 papers in international journals, conference proceedings, and book chapters. He is a co-inventor of about 20 international patents, reviewer for several international journals, and he has been regularly a member of numerous international conference committees. Prof. Battiato has participated in many international and national research projects. He has chaired several international events (VAAM 2014, 2015; VISAPP 2012, 2013, 2014, 2015; ICIAP 2011; ACM MiFor 2010, 2011; SPIE EI Digital Photography 2011, 2012, 2013, etc.); he served as associate editor for IEEE TCSVT (2008–2011) and for SPIE *Journal of Electronic Imaging*. Prof. Battiato has been guest editor of several special issues on various topics related to imaging applications for the following journals: *EURASIP Journal on Image and Video Processing* (2010), *IEEE Multimedia Magazine* (2012), and *Pattern Recognition Letters* (2015). He is the recipient of the 2011 Best Associate Editor Award of the *IEEE Transactions on Circuits and Systems for Video Technology*. He is director (and co-founder) of the International Computer Vision Summer School (ICVSS), Sicily, Italy. Prof. Battiato is a senior member of the IEEE.

Jacques Blanc-Talon received his PhD degree from Paris XI (Orsay) University in 1991. After a postdoc at CSIRO in Australia, he joined the Ministry of Defence in France. He worked as Scientific Manager, Head of the “Information Engineering and Robotics” scientific domain at the DGA/MRIS and is currently with the Integrated Navigation Systems department. He was the French delegate of several NATO Groups and of the Horizon 2020 Security Research Programme Committee. J. Blanc-Talon has conducted the review of around 400 PhD and postdoc grant applications, has participated in 80 defence juries and has supervised some 40 PhD students. He has published about 90 scientific papers and was the editor or co-editor of 12 books and special journals issues. He served as associate editor for IOS ICAE from 2000 to 2006, and IEEE TIP from 2005 to 2008; he is a reviewer for IEEE PAMI and TIP, *IEEE Electronics Letters*, *SIAM Journal on Applied Mathematics*, and *IAPR Pattern Recognition*. He has been involved in the organization of more than 90 international conferences. J. Blanc-Talon was promoted to “Chevalier de l’ordre des Palmes Académiques” in 2010, and IEEE Senior Member in 2015. He is currently the IEEE Chapter Chair for the French Signal Processing Chapter.

Wilfried Philips received a diploma in electrical engineering (1989, *summa cum laude*) and a PhD degree in applied sciences (1993, *summa cum laude*), both from

Ghent University, Belgium. He is currently a senior full professor at the Department of Telecommunications and Information Processing of Ghent University, where he heads the research group “Image Processing and Interpretation,” which currently consists of about 35 researchers. The current interests of the group are in real-time video improvement, image analysis, multi-camera computer vision and big data analysis, for a variety of applications; these include remote sensing, analysis of the behavior of people, visual odometry, and traffic scene analysis. W. Philips is co-author of over 750 papers in scientific conference and journal papers. He is also on the editorial board of the *Journal of Ambient Intelligence and Smart Environments* (JAISE).

W. Philips is a senior member of IEEE. Recently, he also became a founding partner of the company Senso2Me, which currently focuses on Internet of Things solutions for elderly care. He is also the promoter of Ghent University’s Innovation Centre for Intelligent Information Processing — iKnow, which aims to market Ghent University’s research through partnerships with companies, licensing agreements, and the creation of spin-offs.

Dan Popescu completed his undergraduate and postgraduate studies at the Polytechnical Institute of Bucharest, Romania, between 1975 and 1980, graduating with an MEngSc degree (honors) in Computer Science. In 1977 he won the national mathematical competition for engineering students, and represented Romania at the 6th Balkan Mathematics Olympiad, in Belgrade (Serbia), where he won the first prize. From 1980 until 1990 he worked in a joint research team from industry and academia, firstly as an engineer with the Factory for Computer Peripherals (1980–1984), and then as a research engineer and adjunct professor in the Electronics and Telecommunications Department of the Polytechnical Institute of Bucharest (1984–1990). During this period he developed both system and application software for a new graphical personal computer. He provided technical assistance and took part in the installation of the system in Sofia, Dresden, and Magdeburg. In 1991, he briefly worked for a software development company in Dusseldorf, Germany. During 1992–1996 he completed his PhD studies at Sydney University, in the department of Electrical Engineering. Since April 1996, he has been a research scientist with CSIRO, initially with the Division of Information Technology, and currently with the ICT Centre. He worked on several projects focusing on the themes of imaging and vision, with applications to remote sensing, image coding and acquisition, and virtual reality and haptic interaction, applied to the simulation of medical procedures. His interests include image and signal processing, pattern recognition, coding theory, modeling and simulation. He likes to combine his natural mathematical skills and his engineering background to solve real-world problems.

Paul Scheunders received a BS degree and a PhD degree in physics, with work in the field of statistical mechanics, from the University of Antwerp, Belgium, in 1983 and 1990, respectively. In 1991, he became a research associate with the Vision Lab, Department of Physics, University of Antwerp, where he is currently a professor. His current research interest includes remote sensing and hyper-spectral image processing. He has published over 150 papers in international journals and proceedings in the field of image processing, pattern recognition, and remote sensing. Paul Scheunders is associate editor of the *IEEE Transactions in Geoscience and Remote Sensing*, and has served as program committee member in numerous international conferences on remote sensing. He is senior member of the IEEE Geoscience and Remote Sensing Society.



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